UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,306	04/20/2004	Fengguo Sun	110-4 US	2560

24949 7590 02/15/2007

TEITELBAUM & MACLEAN
280 SUNNYSIDE AVENUE
OTTAWA, ON K1S 0R8
CANADA

EXAMINER	
WANG, QUAN ZHEN	
ART UNIT	**PAPER NUMBER**
2613	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/15/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/827,306	SUN ET AL.	
	Examiner	Art Unit	
	Quan-Zhen Wang	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 April 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because page 4 of the drawings only contains two unlabeled rectangles and it is not clear what these two rectangles represent. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-4, 7-15, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kenny et al. (U.S. Patent Application Publication US 2004/0222364 A1) in view of the Admitted Prior Art fig. 1 (APA).

Regarding claim 1, Kenny discloses an apparatus comprising: a spectrally selective reflecting element (fig. 1, grating 1) having a reflecting bandwidth disposed to receive the optical channel radiation for reflecting at least a portion of the signal component to form reflected radiation (fig. 1, reflected signal R), and for transmitting at least a portion of the noise component to form transmitted radiation (fig. 1, transmitted signal T); a first optical detector (fig. 1, detector 3r) disposed to receive at least a fraction of the reflected radiation for producing a first information signal indicative of the signal component; a second optical detector (fig. 1, 3t) disposed to receive the transmitted radiation for producing a second information signal indicative of the noise component, optical coupling means (fig. 1, coupler 2) for coupling the optical channel radiation into the spectrally-selective reflecting element, and for coupling at least a fraction of the reflected radiation into the first optical detector; processing means (fig. 1, μP 5) disposed to receive and process the first information signal and the second

information signal. Kenny differs from the claimed invention in that Kenny does not specifically disclose using the apparatus to measure OSNR. However, it is well known in the art to measure to signals to determine OSNR. For example, The APA discloses to determine OSNR by measuring two optical signals (the instant specification, fig. 1, optical signals measured with detectors 128 and 130. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to configure the apparatus of Kenny to use two signals to measure OSNR, as it is disclosed by the APA, in order to monitor system performance of an optical communication.

Regarding claim 2, Kenny discloses that the spectrally selective reflecting element is a fiber Bragg grating.

Regarding claim 3, Kenny discloses that the optical coupling means is a bidirectional optical coupler.

Regarding claim 4, Kenny discloses that the first information signal and the second information signals are electrical signals.

Regarding claim 7-8, Kenny differs from the claimed invention in that Kenny does not specifically disclose that the first detector detects optical power of a signal component and the second detector detects optical power of noise. However, detecting optical power of a signal component using a first detector and detecting optical power of noise using a second detector is well known in the art. For example, the APA discloses detecting optical power of a signal component using a first detector and detecting optical power of noise using a second detector (instant specification fig. 1, detectors 128

and 130). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to configure the system of Kenny to detect optical power of a signal component using a first detector and to detect optical power of noise using a second detector, as it is disclosed in the APA, in order to measure OSNR.

Regarding claim 9, the modified system of Kenny and APA can inherently used for real-time monitoring OSNR.

Regarding claims 10-12, 17, and 19, Kenny and APA differ from the claimed invention in that Kenny and APA do not specifically disclose the specific the center wavelength and bandwidth of the Bragg grating. However, It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the grating having a tunable center wavelength of λc, the reflecting bandwidth greater than the signal bandwidth, and the passing bandwidth is greater than the reflected bandwidth, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).*

Regarding claim 13, Kenny and APA differs from the claimed invention in that Kenny does not specifically disclose that a substantial portion of the noise component is due to amplified spontaneous emission (ASE). However, it is a common knowledge in the art that ASE contribute to the noise component of optical signals.

Regarding claims 14-15, Kenny has been discussed above in regard with claim 1. Kenny differs from the claimed invention in that Kenny does not specifically disclose providing processing means disposed to receive the first electrical signal indicative of

the signal component and the second electrical signal indicative of the noise component for determining the optical signal to noise ratio by calculating the ratio of the two signals. However, it is well known in the art to use processing means to receive a first electrical signal indicative of the signal component and a second electrical signal indicative of the noise component for determining the optical signal to noise ratio by calculating the ratio of the two signals. For example, the APA discloses to use processing means to receive a first electrical signal indicative of the signal component and a second electrical signal indicative of the noise component for determining the optical signal to noise ratio (instant application fig. 1, processor 132). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to configure the processing means of Kenny to receive a first electrical signal indicative of the signal component and a second electrical signal indicative of the noise component for determining the optical signal to noise ratio by calculating the ratio of the two signals, as it is disclosed by the APA, in order to measure and calculate OSNR.

Regarding claim 18, Kenny discloses an apparatus consisting of a fiber Bragg grating (fig. 1, grating 1) having a reflecting bandwidth disposed to receive the optical channel radiation for reflecting at least a portion of the signal component to form reflected radiation (fig. 1, reflected signal R), and for transmitting at least a portion of the noise component to form transmitted radiation (fig. 1, transmitted signal T); a first optical detector (fig. 1, detector 3r) disposed to receive at least a fraction of the reflected radiation for producing a first information signal; a second optical detector (fig. 1, detector 3t) disposed to receive the transmitted radiation for producing a second

information signal; optical coupling means (fig. 1 coupler 2) for coupling the optical channel radiation into the spectrally-selective reflecting element, for coupling at least a fraction of the reflected radiation into the first optical detector, and for coupling the transmitted radiation into the second optical detector; processing means (fig. 1, processor μP 5) disposed to receive and process the first information signal and the second information signal. Kenny differs from the claimed invention in that Kenny does not specifically disclose using the apparatus to measure OSNR. However, it is well known in the art to measure to signals to determine OSNR. For example, The APA discloses to determine OSNR by measuring two optical signals (fig. 1, optical signals measured with detectors 128 and 130. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to configure the apparatus of Kenny to use two signals to measure OSNR, as it is disclosed by the APA, in order to monitor system performance of an optical communication.

4. Claims 5-6, 16, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kenny et al. (U.S. Patent Application Publication US 2004/0222364 A1) in view of the Admitted Prior Art fig. 1 (APA) and further in view of Mittal (U.S. Patent US 6,952,529 B1).

Regarding claim 5, Kenny and APA differ from the claimed invention in that Kenny and APA do not specifically disclose that the process means comprises a suitable programmed microprocessor for determining OSNR. However, using a suitable programmed microprocessor for determining OSNR with two measured information is

well known in the art. For example, Mittal discloses using a suitable programmed microprocessor for determining OSNR with two measured information (fig. 4, OSNR selector 470). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a suitable programmed microprocessor for determining OSNR, as it is taught by Mittal, in the system of Kenny in order to calculate OSNR.

Regarding claims 6 and 20, Kenny and APA differ from the claimed invention in that Kenny and APA do not specifically disclose that the process means includes a look-up table of predetermined calibration data for determining the OSNR from the first information signal and the second information signal. However, using a look-up table for determining the OSNR from a first information signal and a second information is well known in the art. For example, Mittal discloses using a look-up table for determining the OSNR from a first information signal and a second information (column 6, lines 45-61). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a using a look-up table of predetermined calibration data for determining the OSNR from a first information signal and a second information, as it is taught by Mittal, in the system of Kenny in order to calculate OSNR.

Regarding claim 16, the modified system of Kenny and APA differs from the claimed invention in that Kenny and APA do not specifically disclose that the process means includes a look-up table for determining the OSNR from the first information signal and the second information signal. However, using a look-up table for determining the OSNR from a first information signal and a second information is well

known in the art. For example, Mittal discloses using a look-up table for determining the OSNR from a first information signal and a second information (column 6, lines 45-61). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a using a look-up table for determining the OSNR from a first information signal and a second information, as it is taught by Mittal, in the modified system of Kenny and APA in order to calculate OSNR.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571) 272-3114. The examiner can normally be reached on 9:00 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

qzw
2/11/2007

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600